

Advanced Liquid Logic



GENERAL DESCRIPTION:

Advanced Liquid Logic, Inc. (ALL) is committed to the development of cost-effective automation solutions for complex bioassay workflows. Our proprietary digital microfluidics technology is broadening the availability of molecular diagnostics, enabling new bioanalytical products and accelerating and improving life science research. ALL has developed a patented liquid handling technology called "digital microfluidics" that drastically reduces the cost, complexity and time required for fully automated sample-in/answer-out workflows. The key factors that differentiate the ALL system are:



- Assay flexibility
- Low cost
- Broadly deployable

An exhaustive range of assay formats, relevant to clinical diagnostics and general life sciences research, have been translated to ALL's digital microfluidics technology. Some of the assays that have been implemented on our system include:

- Sample-in/answer-out (qPCR, immunoassays & DNA sequencing)
- Sample extraction & purification
- Next-gen sequencing template prep
- Real-time and Endpoint qPCR
- Immunoassays
- DNA sequencing (pyrosequencing)
- Newborn screening (enzymatic activity assays)
- Cell-based assays
- Clinical chemistry
- Coagulation monitoring

TECHNICAL DESCRIPTION:

The instrument and cartridge-based platform developed by ALL eliminates the need for cumbersome pumps, valves and tubes by manipulating liquid droplets on an array of electrodes. The so-called "electrowetting" effect provides a motive force that is flexibly controlled through software. In conventional microfluidics liquid handling is directed by networks of tubes or channels that must be redesigned for every unique application. ALL's digital microfluidic systems shatter this traditional "one device-one workflow" paradigm. Within the ALL cartridge, electrode arrays are arranged on inexpensive printed circuit boards (PCBs). An injection molded plastic plate above the PCB creates a chamber where droplets are manipulated. Reagents are pre-placed in the cartridge at the time of manufacture to enable minimally-trained personnel to run complex bioanalytical protocols.

Tier Selection

Final tier assignment is based on overall product score.

- Top Tier
- Second Tier
- Third Tier
- ◐ Fourth Tier
- Bottom Tier

RANKINGS

	Biological	Chemical	Radiological
FIELD USE System	●	○ N/A	○ N/A
MOBILE Laboratory	●	○ N/A	○ N/A
DIAGNOSTIC Laboratory	●	○ N/A	○ N/A
ANALYTICAL Laboratory	●	○ N/A	○ N/A

Survey Source

Vendor Supplied Information

CONTACT INFORMATION

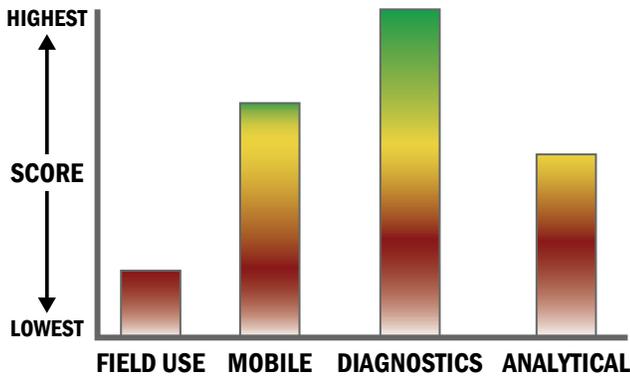
Advanced Liquid Logic
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 Research Triangle Park, NC 27709
 POC David S. Cohen, Ph.D.
 919-287-9010 x 36

COST

- \$20,000/system
- \$20/analysis

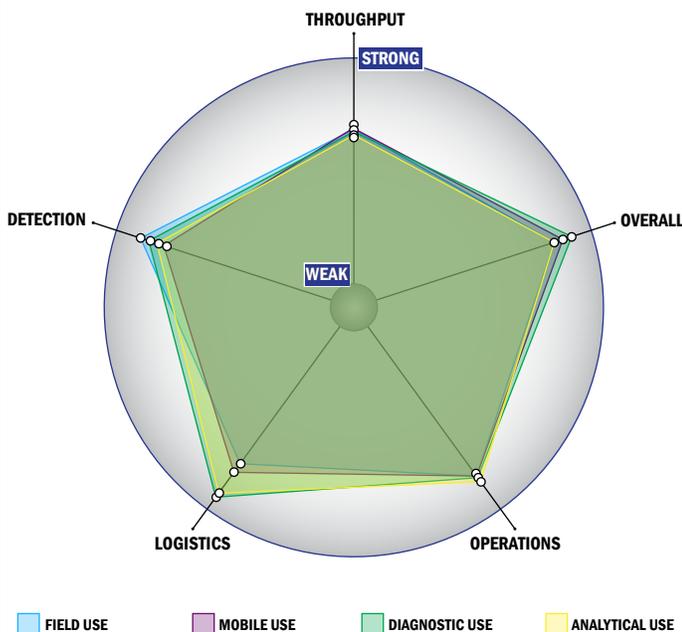
Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



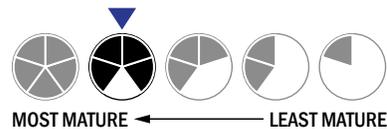
Evaluation Criteria

Throughput:

- Between 15 and 30 minutes for detection
- Multiple samples, multiple tests/sample per run
- 95-32 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 3 solutions, buffer, eluents, and/or reagents
- 1 component
- Less than 5 minutes is required for setup
- 1-2 steps are required for detection

Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a toaster
- Between 5 and 25 kg
- Wired connections are available
- System or device uses batteries
- 4-8 hours battery life



Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at room temperature (27 °C)
- Performance is not influenced by relative humidity
- Between 6 months and 1 year shelf life
- 3-5 years expected life
- Results can be viewed in real-time
- The system could easily be adapted into a fully autonomous
- The system software is open but modification requires licensing
- The system hardware is open but modification requires licensing

Detection:

- Efforts are underway to achieve 510K clearance
- Efforts are underway to achieve FDA approval
- Less than 10 µL
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- 1-100 CFU/mL
- 100-1,000 PFU/mL
- Less than 1 ng/mL
- Add on capability that is full or semi-automated for spore lysis